
New Combinations in the Tribe Poraneae (Convolvulaceae) for the *Flora of China*

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ABSTRACT. New combinations are made for 10 taxa formerly included in the genus *Porana* s.l. in the account of the Convolvulaceae for the *Flora Reipublicae Popularis Sinicae*, which are now considered to belong in the genera *Dinetus*, *Poranopsis*, and *Tridynamia*, as follows: *Dinetus decorus*, *D. dinetoides*, *D. duclouxii*, *D. grandiflorus*, *D. truncatus*, *Poranopsis discifera*, *P. sinensis*, *Tridynamia megalantha*, *T. sinensis* var. *sinensis*, and *T. sinensis* var. *delavayi*. A key to the genera is provided, and 11 additional taxa formerly accepted in *Porana* are reduced to synonymy.

The genus *Porana* N. L. Burman comprises 57 nominate taxa, the majority distributed in mainland tropical Asia. Twenty-eight (14 species, 14 varieties) were recognized in the account of the Convolvulaceae for the *Flora Reipublicae Popularis Sinicae* (Fang & Huang, 1979). My revisionary study of the genus *Porana* and other taxa of the tribe Poraneae H. Hallier (Staples, 1987) indicates that there has been considerable overdescription in the genus *Porana*, and the number of species is actually much lower than the number of named species. Although a comprehensive taxonomic revision of *Porana* s.l. has been submitted to *Systematic Botany Monographs* (Staples, submitted manuscript), several new combinations, and reduction of additional names to synonymy, are needed for the account of the Convolvulaceae for the *Flora of China*, which is scheduled for publication before the revision will appear. This paper makes 10 new combinations needed for use in the *Flora*, and reduces to synonymy 11 other taxa of *Porana* recognized by Fang & Huang (1979).

To summarize the major conclusions of the revision, *Porana* s.l. proved to be a polyphyletic assemblage comprising four distinct groups of species; a preliminary analysis indicated that these four species groups are not a monophyletic lineage inter se (Staples, 1987). I recognize them at generic rank, emending the generic concept of *Porana* to accommodate one group comprising three species, and take up the previously established generic names *Tridynamia* Gagnepain (1950), *Poranopsis* Roberty

(1952), and *Dinetus* Sweet (1825) for the other three groups of species. Furthermore, the genus *Cordisepalum* Verdcourt is maintained as a genus distinct from and closely related to *Poranopsis*. These five genera may be distinguished by the following key. Full descriptions of all taxa, distribution data, ecological and phenological summaries, and detailed nomenclatural discussion are presented in the revision (Staples, submitted manuscript) so they are omitted here.

KEY TO GENERA OF ASIATIC PORANAEAE

- 1a. Leaf venation pinnate, or with a single basal pair of secondary veins; calyx about half as long as the corolla, sepals all \pm equal in length *Porana* s.s.
- 1b. Leaf venation palmate; calyx minute, usually $< \frac{1}{10}$ as long as the corolla, if larger then sepals markedly unequal.
 - 2a. Plants entirely herbaceous; flower buds with a minute apical tuft of hairs, otherwise glabrous externally *Dinetus*
 - 2b. Plants woody (often with herbaceous stem tips); flower buds hairy externally.
 - 3a. Sepals unequal in flower; fruiting sepals with 3–9 parallel longitudinal veins *Tridynamia*
 - 3b. Sepals (sub)equal in flower; fruiting sepals with 1 evident midvein.
 - 4a. Corolla funnelform, white; fruit sessile on torus *Poranopsis*
 - 4b. Corolla rotate, yellowish; fruit borne on a slender stalk *Cordisepalum*

As construed here, *Porana* s.s. and *Cordisepalum* do not occur within the geographic range of the *Flora of China*. Some species of *Poranopsis*, *Dinetus*, and *Tridynamia* occur within the political boundaries of the People's Republic of China, and the following new combinations are proposed for them.

DINETUS SWEET

Dinetus was segregated from *Porana* by Sweet (1825), based on the shape of the corolla, the single filiform style, and 1-celled ovary. He took up *Di-*

netus, an unpublished herbarium name used by Francis Buchanan-Hamilton, at the suggestion of David Don, who had seen the name on Hamilton's specimens in the Lambert herbarium (Sweet, 1825). Sweet included only a single species, *D. racemosus*, when he erected the new genus, but suggested that *P. grandiflora* Wallich and *P. paniculata* Roxburgh would eventually prove to belong to *Dinetus* also. *Porana grandiflora* is herein transferred to *Dinetus* for the first time, while *P. paniculata* is considered a species of *Poranopsis* (q.v.).

As construed here, *Dinetus* includes herbaceous climbers with flower buds glabrous except for a tiny apical tuft of hairs, an entire or apically emarginate, ellipsoidal stigma, and a fruiting calyx reflexed from or tightly wrapped around the fruit, comprised of accrescent sepals with multiple, parallel longitudinal veins. The following new combinations and synonyms are relevant to the *Flora of China*.

Dinetus decorus (W. Smith) Staples, comb. nov.
Basionym: *Porana decora* W. Smith, Notes Roy. Bot. Gard. Edinburgh 8: 197. 1914. TYPE: China. Yunnan: [Xinping Yi-Dai Aut. Xian] valley of Ma-li-ouan, Aug. 1913, *Maire 64* (holotype, E; isotype, BM).

Porana mairei Gagnepain in Gagnepain & Courchet, Notul. Syst. (Paris) 3: 154. 1915, excluding the note about the fruit, based on *Wilson 4186a*, which is *Dinetus duclouxii*. Syn. nov. TYPE: China. Yunnan: [Xinping Yi-Dai Aut. Xian] rochers dans le val de Mali-ouan, *Maire s.n.* (lectotype, selected here, P; isolectotypes, A, E, G, L, P).

Porana microsepala Handel-Mazzetti, Kaiserl. Akad. Wiss. Wien, Math.-Naturwiss. Kl. Anz. 58: 229. 1921. Syn. nov. TYPE: China. Yunnan: [Binchuan Xian] Peyentjing, prope Kuti, 27 Aug. 1919, *Ten 1980* (lectotype, selected here, C; isolectotype, WU).

Porana mairei Gagnepain & Courchet var. *holosericea* Wu Cheng-yi in Fang Rhui-cheng & Huang Shu-hua, Fl. Reip. Pop. Sin. 64(1): 163. 1979. Syn. nov. TYPE: China. Sichuan: Butuo Xian, Aug. 1959, *Sichuan Liangjiang Team 5830* (holotype, KUN; isotype, PE).

Dinetus dinetoides (C. Schneider) Staples, comb. nov. Basionym: *Porana dinetoides* C. Schneider in Sargent, Pl. Wilson. 3: 360. 1916. TYPE: China. Yunnan: Mengtze [Mengzi], alt. 1,700 m, *A. Henry 9340* (holotype, A; isotypes, E, K, MO, NY, US).

Porana megathyrsa Wu Cheng-yi, Yunnan Trop. & Subtrop. Florist. Res. Rep. 1: 101, pl. 18. 1965. Syn. nov. TYPE: China. Yunnan: Shuangjiang Xian, *Sin G. S. 1044* (holotype, KUN; isotypes, IBSC, KUN, PE).

Porana brevisepala Wu Cheng-yi & Huang Shu-hua in Fang Rhui-cheng & Huang Shu-hua, Flora Yun-

nanica 2: 630. pl. 179, f. 4, 5. 1979. Syn. nov. TYPE: China. Yunnan: Kwangnan [Guangnan Xian], Li zhi guo, [Huaguoqing], 8 Nov. 1964, *Wu C. A. 9775* (holotype, KUN; isotype, KUN).

Porana dinetoides C. Schneider in Sargent var. *mienningensis* Huang Shu-hua in Fang Rhui-cheng & Huang Shu-hua, Fl. Reip. Pop. Sin. 64: addendum 163. 1979. Syn. nov. TYPE: China. Sichuan: Mianning Xian, King-Khoang [Jing Song], *Ying T. S. 4342* (holotype, KUN not seen; isotype, KUN).

Dinetus duclouxii (Gagnepain & Courchet) Staples, comb. nov. Basionym: *Porana duclouxii* Gagnepain & Courchet, Notul. System. (Paris) 3: 153. 1915. TYPE: China. Yunnan: Ky-y, près My-lè [Mile Xian], 5 Sep. 1907, *Ducloux 5459* (lectotype, selected here, P).

Porana triserialis C. Schneider in Sargent, Pl. Wilson. 3: 356. 1916. Syn. nov. TYPE: China. Sichuan: Tung River valley, near Wa-shan, Sep. 1908, *A. Henry 3220* (holotype, A; isotypes, A, BM, E, F, K, MO, US).

Porana triserialis var. *lasia* C. Schneider in Sargent, Pl. Wilson. 3: 362. 1916. Syn. nov. *Porana duclouxii* Gagnepain & Courchet var. *lasia* (C. Schneider) Handel-Mazzetti, Symb. Sin. 7: 809. 1936. TYPE: China. Yunnan: "probably at Mengtze" [Mengzi], *A. Henry 9229c pro parte* (holotype, A).

Porana lutingensis Lingelsheim in Limpricht, Repert. Spec. Nov. Regni Veg. 12: 471. 1922. Syn. nov. TYPE: China. Sichuan: "Lu ting tschiao [Luding Xian], Talhänge des Tung ho an der Strasse nach Wa sse kou, Ta tsien lu," *A. Limpricht 1628* (holotype, not seen; photo and fragment at A ex WRSL).

Porana lobata Wu Cheng-yi, Yunnan Trop. & Subtrop. Florist. Res. Rep. 1: 105, pl. 34, f. 3. 1965. Syn. nov. TYPE: China. Sichuan: Kwang-yun Hsien [Guangyuan Xian], 28 Sep. 1930, *Wang F. T. 22608* (holotype, KUN; isotypes, NAS, PE).

Dinetus grandiflorus (Wallich) Staples, comb. nov. Basionym: *Porana grandiflora* Wallich in Roxburgh, Fl. Ind. ed. Carey, 2: 41. 1824. *Dinetopsis grandiflora* (Wallich) Roberty, Candollea 14: 27. 1952. TYPE: Nepal. Sheoparie [Sheopore], *Wallich*, July 1821 (lectotype, selected here, K-W 1324.1.A, excluding packet contents; isolectotype, CAL-Wallich 1324.bis, sheet 314331).

Porana stenoloba Kurz, J. Bot. 11: 136. 1873. TYPE: [India. West Bengal:] Sikkim-Himalaya, not infrequent along the post-road from Kersiong to Darjeeling, *S. Kurz*, 25 Oct. 1868 (holotype, CAL; isotypes, K).

Ipomoea cuspidata D. Don, Prodr. Fl. Nepal. 98. 1825. TYPE: Nepal. Sine loco, *Hamilton s.n.* (type not found); synonymized by Hallier (1911).

Dinetus racemosus (Roxburgh) Buchanan-Hamilton ex Sweet, Brit. Fl. Gard. 2: pl. 127. [1

Oct.] 1825. *Porana racemosa* Roxburgh ex Wallich in Roxburgh, Fl. Ind. 2: 41. [Mar.–June] 1824. TYPE: Sine loco, *Herb. Roxburgh s.n.* (lectotype, selected here, K-W 1326E, 1 excluding fruiting specimen at lower left, 1326E, 2).

Porana cordifolia Ledebour, Ind. Semin. Horti Acad. Dorpat., suppl. 2: 6. [6 Dec.] 1824. TYPE: Estonia. [Tartu:] cult. in hort. bot. Dorpat, *Herb. Ledebour s.n.* (lectotype, selected here, LE; isolectotypes, LE, W).

Porana racemosa J. Jacquin in Sprengel, Syst. Veg. ed. 16, 1: 614. 1825 [late 1824]; Ecl. Pl. Rar. 2: 11, pl. 165. 1844, non Roxburgh ex Wallich in Roxburgh (1824). TYPE: Nepal. Sine loco, *Wallich distr. 1326* (lectotype, selected here, W; isolectotypes, LE, S, W).

Porana dichotoma Buchanan-Hamilton ex D. Don, Prodr. Fl. Nepal. 99. [1 Jan.–1 Feb.] 1825 cited as synonym, invalid under Article 34.

Porana elegans Zollinger & Moritzi, Natuur-Geneesk. Arch. Ned.-Indië 2: 571. 1846 [1845]. TYPE: [Indonesia.] Java: in montosis Tengger, pr. Poespo, Oct. 1844, *Zollinger distr. 2560* (lectotype, selected here, A; isolectotypes, BM, G, LE, P).

Porana gagnepainiana Lévêille, Cat. Pl. Yun-Nan 58. 1916. TYPE: China. Yunnan: haies de la plaine à Long-Ky, E. Maire, June 1912 (holotype, E; isotypes, A, G, W).

Porana racemosa var. *tomentella* Wu Cheng-yi, Yunnan Trop. & Subtrop. Floristics Res. Rep. 1: 103. pl. 33, fig. 4. 1965. Syn. nov. TYPE: China. Yunnan: Jennyeh Hsien, Hwei-du, Oct.–Nov. 1936, *Wang C. W. 80276* (holotype, KUN; isotype, A).

Porana racemosa var. *violacea* Wu Cheng-yi, Yunnan Trop. & Subtrop. Floristics Res. Rep. 1: 103. pl. 34, fig. 1. 1965. Syn. nov. TYPE: China. Sichuan: Muli Xian, 7 Sep. 1937, *Yü T. T. 14179* (holotype, KUN; isotypes, A, KUN).

Dinetus truncatus (Kurz) Staples, comb. nov. Basionym: *Porana truncata* Kurz, J. Bot. 11: 136. 1873, non *P. truncata* (Göppert) Schimper (1890), a fossil species. TYPE: Myanmar. [Pegu Division:] Karenee hills near Toungoo, Dec. 1858, *F. Mason 17* (lectotype, selected here, K; isolectotype, HBG).

Porana racemosa var. *sericocarpa* Wu Cheng-yi, Yunnan Trop. & Subtrop. Floristics Res. Rep. 1: 103, pl. 33, fig. 3. 1965. Syn. nov. TYPE: China. Yunnan: Jingdong Xian, Wuliangshan, 27 Oct. 1950, *Chiu P. Y. 53220* (holotype, KUN; isotypes, KUN, PE).

PORANOPSIS ROBERTY

Roberty (1952) segregated the genus *Poranopsis* from *Porana* s.l. and included two species in it, one with large flowers, *P. spectabilis* (including *Porana megalantha* as a synonym), and one with small flowers, *P. paniculata*. Later, Roberty (1964) typified the genus on *Poranopsis paniculata*. I have

restricted Roberty's generic concept to include only small-flowered taxa with an accrescent fruiting calyx in which the three outer sepals are dramatically enlarged and each sepal has a single prominent midvein, which gives rise to a reticulum of much finer secondary veins. This emended generic concept includes three species, two of which occur naturally in China and require new combinations. The third species, *Poranopsis paniculata* (Roxburgh) Roberty, ranges widely across the Indian subcontinent from Pakistan to Myanmar and is rather common throughout, but has been collected only once from China, on the Chinese side of the border area between Xizang Autonomous Province [Tibet] and Arunachal Pradesh state, northeastern India.

Poranopsis discifera (C. Schneider) Staples, comb. nov. Basionym: *Porana discifera* C. Schneider in Sargent, Pl. Wilson. 3(2): 358. 1916. *Cardiochlamys discifera* (C. Schneider) Wu Cheng-yi, Yunnan Trop. & Subtrop. Floristics Res. Rep. 1: 106, pl. 34, fig. 4. 1965. TYPE: China. Yunnan: Szemao [Simao prefect., Pu'er Xian], forests to south, *A. Henry 12694* (holotype, A; isotypes, A, K, MO, NY, fragment W).

Poranopsis sinensis (Handel-Mazzetti) Staples, comb. nov. Basionym: *Cardiochlamys sinensis* Handel-Mazzetti, Akad. Wiss. Wien Sitzungsber. Math.-Naturwiss. Kl. Abt. 1, 57: 241. 1920. *Porana henryi* Verdcourt, Kew Bull. 26: 137. 1971, nomen novum, non *P. sinensis* Hemsley (1890). TYPE: China. Yunnan: in faucibus fluminis Djinscha-djiang [Jinsha Jiang] ad septentr. urbis Yünnanfu [Kunming], 19 Mar. 1914, *Handel-Mazzetti 751* (holotype, W; isotype, WU).

TRIDYNAMIA GAGNEPAIN

Gagnepain (1950) erected the genus *Tridynamia* for a single species, *T. eberhardtii*, from Indochina that had three much enlarged, winglike fruiting sepals. Ooststroom (1963) recognized that *T. eberhardtii* was referable to *Porana*, but he could not decide whether the species already had a name in that genus; he stated that *T. eberhardtii* was very closely related to *Porana spectabilis* Kurz, and might be conspecific with it.

I have resurrected Gagnepain's generic name for a group of four species and two varieties segregated from *Porana* s.l. *Tridynamia* may briefly be characterized as having the outer two or three sepals greatly enlarged in fruit, with 3–9 parallel longitudinal veins in the sepals, and no evident midvein. A calycle of two or three sepaloid bracts is often

present below the true calyx. The genus is distributed from northeastern India across Myanmar, southern China, including Hainan Island, Thailand, Indochina, and south as far as peninsular Malaysia and the Andaman Islands. Two species, one comprising two varieties, occur in China, necessitating the following new combinations.

Tridynamia megalantha (Merrill) Staples, comb. nov. Basionym: *Porana megalantha* Merrill, Lingnan Sci. J. 14: 53. fig. 18. 1935. *Porana spectabilis* Kurz var. *megalantha* (Merrill) How in Chun W. Y., Fl. Hainanica 3: 475. fig. 867. 1974. TYPE: China. Hainan Island, Ngai distr., Ch'iu Sam Ts'uen, 7–25 Aug. 1932, Lau S. K. 373 (holotype, NY; isotypes, A, B, BM, E, G, K, MICH, MO, P, PE, UC, US, W).

Many authors (e.g., Gagnepain & Curchet, 1915; Fang & Huang, 1979) have long misinterpreted *Porana megalantha* and *P. spectabilis*. The two are distinct species, the former distributed throughout the range of the genus, the latter narrowly endemic in western Thailand and adjacent eastern Myanmar. No authentic material of *P. spectabilis* has been seen from China, and all specimens called that are actually *P. megalantha*.

Tridynamia sinensis (Hemsley) Staples var. **sinensis**, comb. nov. Basionym: *Porana sinensis* Hemsley, Index Fl. Sinensis 2: [J. Linn. Soc. Bot. 26] 167. 1890. TYPE: China. Kwangtung: [Guangdong, Lienchan River], 27 Aug. 1887, C. Ford 290 (holotype, K; isotypes, IBSC, P).

Porana esquirolii A. Léveillé, Repert. Spec. Nov. Regni Veg. 9: 444. 1911. TYPE: China. Kouy-Tcheou [Guizhou:] sine loco [Petrus Hiá], *J. Esquirol* 976 (holotype, E, photo A; isotypes, A, K).

Vatica cordata Hu H. H., J. Arnold Arbor. 11: 225. 1930. TYPE: China. Kwangsi [Guangxi:] Bako Shan, W of Poseh Hsien [Bose Xian], 14 Sep. 1928, Ching R.C. 7426 (holotype, PE; isotypes, fragment A, IBSC, W).

Tridynamia sinensis var. **delavayi** (Gagnepain & Curchet) Staples, comb. nov. Basionym: *Porana delavayi* Gagnepain & Curchet, Notul. Syst. (Paris) 3: 153. July 1915. *Porana sinensis* Hemsley var. *delavayi* (Gagnepain & Curchet) Rehder, J. Arnold Arbor. 15: 319. 1934. TYPE: China. Yunnan: rochers de Ki-Mi-Se, près Kiang-yu [Jiangyun], [30 May 1888], *Delavay* 3539 (lectotype, P; isolecto-

type, A; in effect designated by Huang Shuhua in Fl. Yunnanica 2: 626. 1979).

Porana confertifolia Wu Cheng-yi, Yunnan Trop. & Subtrop. Florist. Res. Rep. 1: 104. pl. 34, fig. 2. 1965. Syn. nov. TYPE: China. Sichuan: Tsing-chuan-fu Hsien [Jinchuan Xian], 21 Aug. 1930, Wang F. T. 22308 (holotype, KUN).

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